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**SUMMARY OF CODES & STANDARDS
OF THE
BOILER INDUSTRY
2001**

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FOREWORD

This document was prepared by the American Boiler Manufacturers Association (ABMA) to give guidance in the selection of appropriate codes and standards as they apply to the boiler industry. The complete code and standard should be consulted before any decision affecting boilers or steam generators is made.

The contents of this document are offered for guidance only. The American Boiler Manufacturers Association does not assume responsibility or liability for consequences arising from implementation or failure to implement the guidance contained herein, nor does ABMA warrant that this document is error-free. The contents of this guide should not be construed as an endorsement by ABMA of any product or manufacturer.

This guide is intended as an information piece and as a supplement to manuals furnished by referenced organizations or suppliers who should be consulted regarding their use.

ABMA – A Force in the Boiler Industry

The ABMA has one goal: to promote the welfare of the boiler and related products of the industry. It strives to improve services to the public, to cooperate with government in setting public policy, and to be both proactive and reactive in issues concerning its membership. The ABMA also provides a common forum for the industry to improve its technology, establish guidelines for codes and standards, develop safety programs, assure quality, and perform research.

Founded in 1888, the ABMA is a voluntary, non-profit corporation headquartered in Arlington, VA.

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NATIONAL BOARD OF BOILER & PRESSURE VESSEL INSPECTORS

National Board Inspection Code (ANSI/NB-23: NBIC)

Criteria for Registration of Boilers, Pressure Vessels and Pressure Retaining Items
(NB 264)

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NFPA

Standard for the Installation of Oil-Burning Equipment (NFPA-31-2001)

National Fuel Gas Code (NFPA-54-1999)

Boiler and Combustion Systems Hazards Code (NFPA-85-2001)

National Electrical Code (NFPA-70-2002)

UNDERWRITERS LABORATORIES (UL)

Standard for Safety for Oil Burners (UL 296)
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Commercial/Industrial Gas Heating Equipment (UL 795)
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Equipment (UL 2096)
Standard for Safety for Field Erected Boiler Assemblies (UL 2106)

(Select) INTERNATIONAL CODES AND STANDARDS

British Standards Institution
Canadian Standards Association
European Committee for Standardization En (CEN)
Syndicat National de la Chaudronnerie, de la Toelerie et de la Tuyauterie Industrielle
(French)
Association Francaise des Ingonieurs en Appareils I Pression (French)

U. S. EPA

Emission Standards and Compliance Issues

ASHRAE/IESNA Standard 90.1 – 1999

Energy Standard for Buildings Except Low-Rise Residential Buildings

Standard 90.1 provides minimum requirements for the energy-efficient design of building systems. It applies to all buildings except low-rise residential buildings (low-rise means three habitable floors or less). The Standard is written in building code language and is intended for adoption by national, state/province, and local code jurisdictions. The Standard specifies design practices and technologies that minimize energy consumption without sacrificing either the comfort or productivity of the occupants.

The Standard is broad in scope, encompassing almost all-new building construction (except low-rise residential). The requirements of Standard 90.1 are appropriate for a wide range of building types, all of the world's climates, and for a variety of site conditions. When designing a specific building on a specific site for a specific climate, design issues will undoubtedly have to be addressed that go beyond those considered in the Standard.

Standard 90.1:

- Is written in code-enforceable language and contains recommendations as well as requirements.
- Is international. Criteria are provided for countries and climates all over the world.
- Contains the requirements for the building envelope, lighting, and HVAC systems, which are autonomous and independent of each other, unless the energy cost budget method is used.
- Clarifies the application to existing buildings and specifically addresses additions, alterations, and change in use.
- Offers a true prescriptive compliance path for building envelope compliance.
- Precalculates U-factors for a broad range of common assemblies simplifying compliance with the building envelope requirements for those using one of the performance options and provides consistency between development and implementation.
- Contains envelope design criteria specified separately for different classes of wall, roof, and floor construction.
- For fenestration, emphasis is changed from limiting glass area to requiring appropriate performance for each range of window-wall ratio.
- Indicates building envelope trade-off options to expand permit trade-offs between all building envelope elements.
- Simple system options offered for certain packaged mechanical systems.
- Lighting power limits and lighting control requirements that are greatly simplified.

Standard 90.1 is divided into 11 sections.

Sections 1, 2, 3, 4, and 12 are administrative:

Section 1 – Purpose: states the purpose of the Standard.

Section 2 – Scope: describes where the Standard applies and does not apply.

Section 3 – Definitions, Abbreviations, and Acronyms: provides definitions of terms that are used throughout the Standard and list of abbreviations, acronyms and symbols.

Section 4 - Administration and Enforcement: gives an overall of the Standard's compliance requirements, compliance documentation, materials and equipment labeling, and other administrative requirements.

Section 12 – Normative References: lists references and citations used in the Standard.

Sections 5 through 11 are the technical sections of the Standard. Sections 5 through 10 contain the technical requirements for distinct components of the building's design, while Section 11 offers an alternative whole building approach to complying with the Standard.

Section 5 – Building envelope including fenestration (glazing).

Section 6 – HVAC systems, (boiler) equipment, and controls.

Section 7 – Service water heating equipment and systems.

Section 8 – Building power distribution systems.

Section 9 – Interior and exterior lighting systems and controls.

Section 10 – Permanently wired electric motors.

Section 11 – The requirements for developing a computer model for the energy cost budget compliance method.

Appendix A: Precalculated U-factors, C-factors and F-factors for typical construction assemblies and calculation methods for nontypical construction assemblies.

Appendix B: Tables providing the 26 building envelope criteria sets for a range of climate conditions.

Appendix C: The methodology for the Building Envelope Trade-Off option.

Appendix D: Climate data necessary to determine building envelope and mechanical requirements for various U. S., Canadian, and international locations.

Appendix E: Informative references for the convenience of users of the Standard and acknowledges source documents.

This reprinted material is not the complete and official position of the American Society of Heating, Refrigeration and Air-Conditioning Engineers, which is represented only by the Standard in its entirety. Copies of the ASHRAE/IESNA 90.1 document can be obtained by contacting the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, Atlanta, GA 30329

ASME BOILER AND PRESSURE VESSEL CODES

The Boiler and Pressure Vessel Code establishes rules of safety governing the design, fabrication, and inspection of boilers, pressure vessels, and nuclear power plant components during construction. The objective of the rules is to assure reasonable certain protection of life and property and to provide a margin for deterioration in service. Advancements in design and materials and the evidence of experience are constantly being added by addenda.

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Code Cases: Boilers and Pressure Vessels

Code Cases: Nuclear Components

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ASME CONTROL STANDARDS

Safety requirements for the assembly, maintenance, and operation of controls and safety devices installed on automatically operated boilers directly fired with gas, oil, gas/oil, or electricity.

CSD-1-1998 Controls and Safety Devices for Automatically Fired Boilers

- Part CG – General Requirements
- Part CM – Testing and Maintenance
- Part CE – Electrical
- Part CW – Steam and Waterside Control
- Part CF – Combustion Side Control
- Appendix A – Comparison of CSD-1 and ANSI Z 21.13
- Appendix B – Typical Fuel Trains
- Appendix C – Manufacturer's/Installing Contractor's Report Form

FORM CSD-1 Manufacturer's/Installing Contractor's Report for ASME CSD-1

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ASME FLOW MEASUREMENT STANDARDS

Standards for fluid flow volume measurements in pipes

MFC-1M-1991	Glossary of Terms Used in the Measurement of Fluid Flow in Pipes
MFC-2M-1983	Measurement Uncertainty for Fluid Flow in Closed Conduits
MFC-3M-1989	Measurement of Fluid Flow in Pipes Using Orifice, Nozzle and Venturi (not American National Standard)
MFC-4M-1986	Measurement of Gas Flow by Turbine Meters
MFC-5M-1985	Measurement of Liquid Flow in Closed Conduits Using Transit-Time Ultrasonic Flowmeters
MFC-6M-1998	Measurement of Fluid Flow in Pipes Using Vortex Flowmeters
MCF-7M-1987	Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles
MFC-8M-1988	Fluid Flow in Closed Conduits-Connections for Pressure Signal Transmitters between Primary and Secondary Devices
MFC-9M-1988	Measurement of Liquid Flow in Closed Conduits by Weighted Method
MFC-10M-1994	Method for Establishing Installation Effects on Flowmeters
MFC-11M-1989	Measurement of Fluid Flow by Means of Coriolis Mass Flowmeters
MFC-14-1995	Measurement of Fluid Flow Using Small Bore Precision Orifice Meters
MFC-16M-1995	Measurement of Fluid Flow in Closed Conduits by Means of Electromagnetic Flowmeters

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